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PJBS

ISSN 1028-8880

**Pakistan
Journal of Biological Sciences**

ANSI*net*

Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

Evaluation of Corn Hybrids for Grain Yield in D.I.Khan

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Abstract

The performance of six corn hybrids i.e. C-922, C-7878, C-7777, C-7877, P-3163 and R-4208 was evaluated for grain yield. The Pioneer hybrid P-3163 produced the highest plant height cob length (16.05 cm) and 1000-grains weight. The corn hybrid C-7777 produced the highest plant stand and grain yield (7.25 t ha^{-1}) while the number of cob per plant (0.945) and number of grains per cob (518.1) were maximum in C-7877. The corn hybrid R-4208 proved to be inferior variety regarding the yield and yield components.

Introduction

Maize is an important cereal crop of Pakistan after wheat and rice. It is grown almost 81 countries of the world. There are different types or groups of maize like pod corn, pop corn, dent corn, flint corn, flour or soft corn, sweet corn and waxy corn. Maize is very important fodder crop. It's nutritious fodder is relished by all types of livestock specially milch animals. The green fodder contained 1.56 protein, 0.30 fat and 5.2 percent fibre. It is short duration crop and is potentially capable of producing the largest quantity of grain per unit area. There are so many factors which are responsible for the low yield of maize. These are indiscriminate use of fertilizers, cultivation of low yielding varieties, non availability of water etc. Among these the most common cause of low productivity is the cultivation and inferior varieties. Therefore, a field trial was carried out select the most suitable and high yielding variety for this area.

Materials and Methods

The experiment was conducted at the Agronomic Research area, Faculty of Agriculture, Gomal University, D.I.Khan during spring 1998. The experiment was laid out in a Randomized Complete Block Design (RCBD) with six treatments and four replications using a net plot size of 3 x 4 m. The approved corn hybrids were planted on all prepared seed bed by hand dibbling. The plant to plant distance was 20 cm and row to row distance was 75 cm. The following hybrids as six treatments were included in study;

Treatments	Hybrid
:	Cargill-922
:	Cargill-7878
:	Cargill-7777
:	Cargill-7877
:	Pioneer-3163
:	Rafhan-4208

The field was well prepared by ploughing and planking. Nitrogen and phosphorous was applied at the rate of 175 and 115 kg N and $\text{P}_2\text{O}_5 \text{ ha}^{-1}$, respectively as Urea and

Tripple Super Phosphate. All the experimental plots received normal and uniform cultural practices. The data so collected was analyzed statistically according to Randomized Complete Block Design. Least significant difference (LSD) was used as a test of significance making a comparison among the varietal means.

Results and Discussion

Plant Stand at Maturity: The data presented in Table 1 revealed that there was significant difference in plant stand at maturity of different corn hybrids. The maximum plant stand was observed in C-7777 followed by C-922 while the minimum was observed in C-7877. The variation in plant population among the different corn hybrids might be due to the viability of seed of different hybrids. These results are in close conformity with that of Mohibullah (1995) who reported simple variation in plant population among the different corn hybrids. The proper crop stand is highly associated for obtaining high yield. If the plant stand is excessive than optimum, a large number of plants will not set seed and in others the ears will be reduced.

Plant height (cm) at maturity: It is evident from the results shown in Table 1 that the highest plant height was found in P-3163 while the lowest was found in R-4208. These variations in height might be due to genetic constitution of seed of different hybrids. Mkhabela *et al.*, (1992) found that pioneer hybrid produced maximum height than other hybrids. Plant height is one of the essential yield component in maize. However, there is an inverse relation between plant height and yield in hybrids which is probably due to its low assimilation rate specially in the lower leaves.

Cobs per Plant (No.): The data given in Table 1 showed that there was statistically non-significant difference in number of cobs per plant among the different hybrids. The data revealed that maximum number of cobs per plant were observed in C-7877 (0.9475) and minimum in R-4208 (0.7825). Rehman *et al.*, (1991) reported that number of cobs among the different corn varieties were non-significant. The similarity in cobs among the different

Khan *et al.*: Corn hybrids, grain yield cob

hybrids was probably due to the same environmental and soil conditions.

Table 1: Plant stand at maturity, plant height, and cobs per plant of different corn hybrids.

Corn hybrids	Plant stand	Plant height	Cobs/plant
O-7777	80,00a*	2.22ab*	0.942a*
O-922	79.50ab	2.12b	0.855a
C-7878	77.75ab	2.26ab	0.935a
R-4208	75,50ab	2.11b	0,782a
P-3163	72.00bc	2.29a	0.887a
C-7877	66.75c	2.15b	0.947a

Table 2: Cob length (cm), rows per cob and grains per cob of different corn hybrids.

Corn hybrids	Cob length	Rows/cob	Grains/cob
P-3163	16.05a	15.15ab*	506.1a*
C-7777	15.87ab	15.57a	489.3ab
C-7878	15.77ab	14.50bc	495.5ab
C-7877	15.53b	15.13ab	518.1a
R-4208	15.07bc	15.90a	451.6c
C-922	14.42c	14.27c	461.5bc

Table 3: 1000-grain weight (g) and grain yield (t ha⁻¹) of different corn hybrids.

Corn hybrids	1000-grain wt	Grain Yield
P-3163	249.3a*	6.635ab*
R-4208	249.0a	5.583b
C-922	242.5ab	6,430ab
O-7777	236.8b	7.246a
C-7878	234.8bc	7.102a
C-7877	227.5c	6.441 ab

* Means not sharing a letter in common differ significantly at 5% level of probability.

Cob length (cm): The Table 2 indicated that the cob length among the different maize hybrids was significantly different from each other. The highest cob length was found in P-3163 (16.05) followed by O-7777 (15.87) while the lowest was found in C-922 (14.42). These variations in cob length might be due to their varietal characteristics.

Rows per cob: The Table 2 elucidated that maximum number of rows per cob was found in R-4208 (15.90) followed by C-7777 (15.57) while C-922 produced

minimum number of rows per cob. The number of plant depend upon the diameter of the cob, which means the 4208 has maximum diameter. Nearly similar results were found by Rehman *et al.*, (1991) who found such variety in number of rows per cob of different corn hybrids.

Grains per cob (No.): The Table 2 showed that the high number of grains were produced in C-7877 (518.11) against lowest number of grains in R-4208 (451.6). The variation in number of grains might be due to the photosynthetic rate and rate of assimilation. Mohibullah (1995) found such variations in number of grains per cobs different corn hybrids.

1000-grain weight (g): The Table 3 showed that the statistically significant difference in 1000-grain weight among the different corn hybrids. The maximum 1000-g weight (249.3) was found in P-3163 followed by R-4208 (249.0) and minimum in C-7877 (227.5). Mkhabela *et al.* (1992) reported that pioneer hybrid has maximum weight than other hybrids. The difference in grain weight might due to the genetic nature of different hybrids.

Grain yield (t ha⁻¹): The Table 3 showed that hybrid 7777 produced maximum grain yield (7.24) followed by 7878 (7.10) while the R-4208 resulted minimum grain yield (5.58). The grain yield is the interaction of many face such as number of cobs, number of grains per cob and grain weight. So on account of these factors C-7777 gave maximum grain yield. Aziz *et al.*, (1992) observed variation in grain yield among the different corn hybrid.

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